§ 98.318 Definitions.

All terms used in this subpart have the same meaning given in the Clean Air Act and subpart A of this part.

Subpart FF—Underground Coal Mines

SOURCE: 75 FR 39763, July 12, 2010, unless otherwise noted.

§ 98.320 Definition of the source category.

(a) This source category consists of active underground coal mines, and any underground mines under development that have operational pre-mining degasification systems. An underground coal mine is a mine at which coal is produced by tunneling into the earth to the coalbed, which is then mined with underground mining equipment such as cutting machines and continuous, longwall, and shortwall mining machines, and transported to the surface. Underground coal mines are categorized as active if any one of the following five conditions apply:

(1) Mine development is underway.

(2) Coal has been produced within the last 90 days.

(3) Mine personnel are present in the mine workings.

(4) Mine ventilation fans are operative.

(5) The mine is designated as an ''intermittent'' mine by the Mine Safety and Health Administration (MSHA).

(b) This source category includes the following:

(1) Each ventilation well or shaft, including both those wells and shafts where gas is emitted and those where gas is sold, used onsite, or otherwise destroyed (including by flaring).

(2) Each degasification system well or shaft, including degasification systems deployed before, during, or after mining operations are conducted in a mine area. This includes both those wells and shafts where gas is emitted, and those where gas is sold, used onsite, or otherwise destroyed (including by flaring).

(c) This source category does not include abandoned or closed mines, surface coal mines, or post-coal mining activities (*e.g.*, storage or transportation of coal).

§ 98.321 Reporting threshold.

You must report GHG emissions under this subpart if your facility contains an active underground coal mine and the facility meets the requirements of § 98.2(a)(1).

§ 98.322 GHGs to report.

(a) You must report CH_4 liberated from ventilation and degasification systems.

(b) You must report CH_4 destruction from systems where gas is sold, used onsite, or otherwise destroyed (including by flaring).

(c) You must report net CH_4 emissions from ventilation and degasification systems.

(d) You must report under this subpart the CO_2 emissions from coal mine gas CH_4 destruction occuring at the facility, where the gas is not a fuel input for energy generation or use (*e.g.*, flaring).

(e) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the CO_2, CH_4, and N_2O emissions from each stationary fuel combustion unit by following the requirements of subpart C. Report emissions from both the combustion of collected coal mine CH_4 and any other fuels.

(f) An underground coal mine that is subject to this part because emissions from source categories described in Tables A–3, A–4 or A–5 of subpart A of this part, or from stationary combustion (subpart C of this part), is not required to report emissions under this subpart unless the coal mine liberates 36,500,000 actual cubic feet (acf) or more of methane per year from its ventilation system.

[75 FR 39763, July 12, 2010, as amended at 76 FR 73901, Nov. 29, 2011]

§ 98.323 Calculating GHG emissions.

(a) For each ventilation shaft, vent hole, or centralized point into which CH_4 from multiple shafts and/or vent holes are collected, you must calculate the quarterly CH_4 liberated from the ventilation system using Equation FF–1 of this section. You must measure CH_4 content, flow rate, temperature,

pressure, and moisture content of the gas using the procedures outlined in §98.324.

$$CH_{4V} = n * \left(V * MCF * \frac{C}{100\%} * 0.0423 * \frac{520°R}{T} * \frac{P}{1\ atm} * 1,440 * \frac{0.454}{1,000} \right) \quad \text{(Eq. FF-1)}$$

Where:

CH_{4V} = Quarterly CH_4 liberated from a ventilation monitoring point (metric tons CH_4).

V = Volumetric flow rate for the quarter (cfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace "$520°R/T \times P/1\ atm$" with "1".

MCF = Moisture correction factor for the measurement period, volumetric basis.

  = 1 when V and C are measured on a dry basis or if both are measured on a wet basis.

  = $1-(f_{H_2O})_n$ when V is measured on a wet basis and C is measured on a dry basis.

  = $1/[1-(f_{H_2O})]$ when V is measured on a dry basis and C is measured on a wet basis.

(f_{H_2O}) = Moisture content of the methane emitted during the measurement period, volumetric basis (cubic feet water per cubic feet emitted gas).

C = CH_4 concentration of ventilation gas for the quarter (%).

n = The number of days in the quarter where active ventilation of mining operations is taking place at the monitoring point.

0.0423 = Density of CH_4 at 520 °R (60 °F) and 1 atm (lb/scf).

520 °R = 520 degrees Rankine.

T = Temperature at which flow is measured (°R) for the quarter.

P = Pressure at which flow is measured (atm) for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.

1,440 = Conversion factor (min/day).

0.454/1,000 = Conversion factor (metric ton/lb).

(1) Consistent with MSHA inspections, the quarterly periods are:

(i) January 1–March 31.

(ii) April 1–June 30.

(iii) July 1–September 30.

(iv) October 1–December 31.

(2) Values of V, C, T, P, and (fH_2O), if applicable, must be based on measurements taken at least once each quarter with no fewer than 6 weeks between measurements. If measurements are taken more frequently than once per quarter, then use the average value for all measurements taken. If continous measurements are taken, then use the average value over the time period of continuous monitoring.

(3) If a facility has more than one monitoring point, the facility must calculate total CH_4 liberated from ventilation systems ($CH_{4VTotal}$) as the sum of the CH_4 from all ventilation monitoring points in the mine, as follows:

$$CH_{4VTotal} = \sum_{i=1}^{m} \left(CH_{4V} \right)_i \quad \text{(Eq. FF-2)}$$

Where:

$CH_{4VTotal}$ = Total quarterly CH_4 liberated from ventilation systems (metric tons CH_4).

CH_{4V} = Quarterly CH_4 liberated from each ventilation monitoring point (metric tons CH_4).

m = Number of ventilation monitoring points.

(b) For each monitoring point in the degasification system (this could be at each degasification well and/or vent hole, or at more centralized points into which CH_4 from multiple wells and/or vent holes are collected), you must calculate the weekly CH_4 liberated from the mine using CH_4 measured weekly or more frequently (including by CEMS) according to 98.234(c), CH_4 content, flow rate, temperature, pressure, and moisture content, and Equation FF–3 of this section.

$$CH_{4D} = \sum_{i=1}^{n} \left(V_i * MCF_i * \frac{C_i}{100\%} * 0.0423 * \frac{520°R}{T} * \frac{P_i}{1\ atm} * 1,440 * \frac{0.454}{1,000} \right) \quad \text{(Eq. FF-3)}$$

Where:

CH_{4D} = Weekly CH_4 liberated from at the monitoring point (metric tons CH_4).

V_i = Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter (cfm). If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace "520°R/T_i × P_i/1 atm" with "1".

MCF_i = Moisture correction factor for the measurement period, volumetric basis.

= 1 when V_i and C_i are measured on a dry basis or if both are measured on a wet basis.

= 1-$(fH_2O)_i$ when V_i is measured on a wet basis and C_i is measured on a dry basis.

= 1/[1-$(fH_2O)_i$] when V_i is measured on a dry basis and C_i is measured on a wet basis.

(fH_2O) = Moisture content of the CH_4 emitted during the measurement period, volumetric basis (cubic feet water per cubic feet emitted gas)

C_i = CH_4 concentration of gas for the days in the week when the degasification system is in operation at that monitoring point (%).

n = The number of days in the week that the system is operational at that measurement point.

0.0423 = Density of CH_4 at 520 °R (60 °F) and 1 atm (lb/scf).

520 °R = 520 degrees Rankine.

T_i = Temperature at which flow is measured (°R).

P_i = Pressure at which flow is measured (atm).

1,440 = Conversion factor (minutes/day).

0.454/1,000 = Conversion factor (metric ton/lb).

(1) Values for V, C, T, P, and (fH_2O), if applicable, must be based on measurements taken at least once each calendar week with at least 3 days between measurements. If measurements are taken more frequently than once per week, then use the average value for all measurements taken that week. If continuous measurements are taken, then use the average values over the time period of continuous monitoring when the continuous monitoring equipment is properly functioning.

(2) Quarterly total CH_4 liberated from degasification systems for the mine should be determined as the sum of CH_4 liberated determined at each of the monitoring points in the mine, summed over the number of weeks in the quarter, as follows:

$$CH_{4DTotal} = \sum_{i=1}^{m} \sum_{j=1}^{w} (CH_{4D})_{i,j} \qquad \text{(Eq. FF-4)}$$

Where:

$CH_{4DTotal}$ = Quarterly CH_4 liberated from all degasification monitoring points (metric tons CH_4).

CH_{4D} = Weekly CH_4 liberated from a degasification monitoring point (metric tons CH_4).

m = Number of monitoring points.

w = Number of weeks in the quarter during which the degasification system is operated.

(c) If gas from degasification system wells or ventilation shafts is sold, used onsite, or otherwise destroyed (including by flaring), you must calculate the quarterly CH_4 destroyed for each destruction device and each point of offsite transport to a destruction device, using Equation FF–5 of this section. You must measure CH_4 content and flow rate according to the provisions in § 98.324, and calculate the methane routed to the destruction device (CH_4) using either Equation FF–1 or Equation FF–3 of this section, as applicable.

$$CH_{4Destroyed} = CH_4 \times DE \qquad \text{(Eq. FF-5)}$$

Where:

$CH_{4Destroyed}$ = Quarterly CH_4 destroyed (metric tons).

CH_4 = Quarterly CH_4 routed to the destruction device or offsite transfer point (metric tons).

DE = Destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99). If the gas is transported off-site for destruction, use $DE = 1$.

(1) Calculate total CH_4 destroyed as the sum of the methane destroyed at all destruction devices (onsite and offsite), using Equation FF–6 of this section.

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$$CH_{4\text{Destroyed Total}} = \sum_{i=1}^{d} \left(CH_{4Destroyed} \right)_d \qquad \text{(Eq. FF-6)}$$

Where:

$CH_{4\text{DestroyedTotal}}$ = Quarterly total CH_4 destroyed at the mine (metric tons CH_4).

$CH_{4\text{Destroyed}}$ = Quarterly CH_4 destroyed from each destruction device or offsite transfer point.

d = Number of onsite destruction devices and points of offsite transport.

(2) [Reserved]

(d) You must calculate the quarterly measured net CH_4 emissions to the atmosphere using Equation FF–7 of this section.

$$CH_4 \text{ emitted (net)} = CH_{4\text{VTotal}} + CH_{4\text{DTotal}} - CH_{4\text{destroyedTotal}} \qquad \text{(Eq. FF-7)}$$

Where:

CH_4 emitted (net)= Quarterly CH_4 emissions from the mine (metric tons).

$CH_{4\text{VTotal}}$ = Quarterly sum of the CH_4 liberated from all mine ventilation monitoring points (CH_{4V}), calculated using Equation FF–2 of this section (metric tons).

$CH_{4\text{DTotal}}$ = Quarterly sum of the CH_4 liberated from all mine degasification monitoring points (CH_{4D}), calculated using Equation FF–4 of this section (metric tons).

$CH_{4\text{DestroyedTotal}}$ = Quarterly sum of the measured CH_4 destroyed from all mine ventilation and degasification systems, calculated using Equation FF–6 of this section (metric tons).

(e) For the methane collected from degasification and/or ventilation systems that is destroyed on site and is not a fuel input for energy generation or use (those emissions are monitored and reported under Subpart C of this part), you must estimate the CO_2 emissions using Equation FF–8 of this section.

$$CO_2 = CH_{4\text{Destroyedonsite}} * 44/16 \qquad \text{(Eq. FF-8)}$$

Where:

CO_2 = Total quarterly CO_2 emissions from CH_4 destruction (metric tons).

$CH_{4\text{Destroyedonsite}}$ = Quarterly sum of the CH_4 destroyed, calculated as the sum of CH_4 destroyed for each onsite, non-energy use, as calculated individually in Equation FF–5 of this section (metric tons).

44/16 = Ratio of molecular weights of CO_2 to CH_4.

[75 FR 39763, July 12, 2010, as amended at 76 FR 73901, Nov. 29, 2011]

§ 98.324 Monitoring and QA/QC requirements.

(a) For calendar year 2011 monitoring, the facility may submit a request to the Administrator to use one or more best available monitoring methods as listed in § 98.3(d)(1)(i) through (iv). The request must be submitted no later than October 12, 2010

and must contain the information in § 98.3(d)(2)(ii). To obtain approval, the request must demonstrate to the Administrator's satisfaction that it is not reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by January 1, 2011. The use of best available monitoring methods will not be approved beyond December 31, 2011.

(b) For CH_4 liberated from ventilation systems, determine whether CH_4 will be monitored from each ventilation well and shaft, from a centralized monitoring point, or from a combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one ventilation well or shaft, as long as emissions from all are addressed, and the methodology for calculating total emissions